



Overview of the AppNav-XE Solution

This guide provides an overview of the AppNav-XE component on the Cisco Cloud Services Router (CSR) 1000V Series in Cisco IOS-XE Release 3.9, and describes the quick start process to easily configure the features. It also provides details of the command line interface (CLI) commands along with examples and troubleshooting tips.

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Overview of the AppNav-XE Solution on the Cisco Cloud Services Router 1000V Series

The AppNav-XE solution for the Cisco Cloud Services Router 1000V Series includes the following:

- AppNav Controller: Component that intelligently distributes traffic from a router to services.
- AppNav service node auto discovery feature: Feature that automatically discovers service nodes and adds them to an AppNav cluster. See the [About the AppNav Service Node Auto Discovery Feature \(For Cisco CSR 1000V Series Only\)](#), on page 4.



Note

The WAAS service nodes are external to the Cisco CSR and their details are outside the scope of this document.

- WAAS Central Manager (WCM): Used to monitor and configure the AppNav-XE component.

**Note**

You can also use WCM to configure and monitor the WAAS service nodes but those details are outside the scope of this document.

Overview of the AppNav-XE Solution on the Cisco ASR 1000 Series Aggregation Services Router

The AppNav-XE solution for the Cisco ASR 1000 Series Aggregation Services Router (called Cisco ASR 1000 Series) includes the following:

- AppNav Controller: Component that intelligently distributes traffic from a router to services.

**Note**

The WAAS service nodes are external to the Cisco ASR 1000 Series and their details are outside the scope of this document.

- WAAS Central Manager (WCM): Used to monitor and configure the AppNav-XE component.

**Note**

You can also use WCM to configure and monitor the WAAS service nodes but those details are outside the scope of this document.

AppNav-XE Component Overview

The AppNav-XE component is made up of a distribution unit called the AppNav Controller and service nodes. The AppNav Controller distributes flows and the service nodes process the flows. Additionally up to four AppNav Controllers can be grouped together to form an AppNav Controller group to support asymmetric flows and high availability. Note that all the routers in the AppNav Controller group need to be the same platform and also have the same memory capacity.

Advantage of Using the AppNav-XE Component

The advantages of using the AppNav-XE component are:

- It can intelligently redirect new flows based on the load on each service node. This includes loads of individual L7 application accelerators.
- For flows that do not require any optimization, service nodes can inform the AppNav Controller to directly pass-through the packets, thereby minimizing the latency and resource utilization.
- There is minimal impact to traffic when adding or removing service nodes.
- The AppNav-XE component supports VRF so that VRF information is preserved when traffic returns from a service node.

- For special applications such as MAPI (Exchange) and VDI (Citrix), the AppNav-XE component ensures that flows from the same client and destined to the same server and server port are redirected to the same service node.
- You can use an AppNav Controller group to optimize asymmetric flows. An asymmetric flow is when the traffic in one direction goes through one AppNav Controller and the return traffic goes through a different AppNav Controller, but both AppNav Controllers redirect the traffic to the same service node.
- Inter-router high availability, where if one router goes down, the traffic can be re-routed to a different router within the AppNav Controller group, keeping the traffic flows uninterrupted.
- Intra-router high availability of the AppNav Controller on Cisco ASR 1000 Series platforms that have dual RP or dual FP. This means that if the active RP fails, the standby RP takes over or if the active FP fails, the standby FP takes over and the flows continue uninterrupted. The intra-router high availability feature is available only on the Cisco ASR 1000 Series platforms.

Interoperability of the AppNav-XE Component

The AppNav-XE component can interoperate with the following features on the router:

- QoS
- NAT (Note that the video application accelerator is disabled and that asymmetric routing and inter-router high availability handled both by the AppNav-XE component and NAT is not supported.)
- AVC 2.0 (FNF, NBAR) (Note that AVC 2.0 does not support asymmetric routing and inter-router high availability.)
- IPSec
- GET-VPN (ASR 1000 Series only)
- EzVPN
- DMVPN
- ACL
- VRF
- MPLS (The supported topology is an MPLS network on the WAN side and an IP network on the LAN side.)
- WCCP-AppNav-XE coexistence (WCCP and AppNav-XE can be configured on the same interface only if they act on different flows. Use ACLs for this. WCCP and AppNav XE can be configured on different interfaces—AppNav-XE on WAN and WCCP on LAN.)
- BPBR/PFR (supported on Cisco IOS releases 3.10.1 or later.

The AppNav-XE component introduces the concept of a virtual interface, which allows users to configure features specific to compressed or uncompressed traffic. For instance, to monitor the traffic that is being redirected to the service node and the traffic that is returning from the service node, you can configure the FNF feature on the AppNav-UnCompress and AppNav-Compress virtual interfaces. Note that these AppNav-XE virtual interfaces appear to the user just as any other interface. However from the above list, the only features that work on the AppNav-XE virtual interfaces are FNF, ACL, and QoS (except for queuing).

About Configuring the AppNav-XE Component

Note the following points regarding configuring the AppNav-XE component:

- You must identify the WAN interfaces for the router that is running the AppNav Controller. The AppNav Controller intercepts packets on both ingress and egress of WAN interface. Only configure the AppNav Controller on WAN interfaces, including all WAN interfaces that will be load balancing.
- Do not use the VRF to access the service node from the AppNav Controller. Neither the service node nor the AppNav Controller IP address should have VRF on the AppNav Controller.
- You can use port channel between the AppNav Controller and the service nodes to increase AppNav Controller-service node bandwidth.
- The config replace command cannot be used with AppNav-XE configuration.
- If you use an AppNav Controller group with two or more AppNav Controllers, the AppNav-XE configuration on all the AppNav Controllers must be the same. This also means that the names of the AppNav policy maps and class maps on the AppNav Controllers need to match. Also the VRF names for the traffic seen by the AppNav-XE component need to be the same on all the AppNav Controllers.
- If AppNav-XE is managed by WCM, the authentication key in the service-context configuration cannot be modified using the command line interface (CLI).

For additional information and caveats about configuring the AppNav-XE component, see [Chapter 1, “Detailed Configuration”](#).

About the AppNav Service Node Auto Discovery Feature (For Cisco CSR 1000V Series Only)

The AppNav service node auto discovery feature is targeted for small branch installations. With this feature, the system automatically discovers the service nodes within the same L2 connectivity of the AppNav-XE router and adds them to the service node cluster.

Restriction

The AppNav service node auto discovery feature can only be enabled on one interface on a service node.

To enable the AppNav service node auto discovery feature, do the following:

SUMMARY STEPS

1. Initiate a discovery request on the AppNav-XE component on router by doing the following:
2. Initiate a service respond on the service nodes by doing the following:

DETAILED STEPS

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- Step 1** Initiate a discovery request on the AppNav-XE component on router by doing the following:
- a) Determine the service node group for which you want to enable the auto discovery.
 - b) Issue the following commands:

Example:

```
router(config)# service-insertion service-node-group sng  
router(config-service-insertion-sng)# node-discovery enable
```

Step 2

Initiate a service respond on the service nodes by doing the following:

- a) On the WAAS appliance, determine the interface for which you want to enable node discovery. This interface must be in the same subnet as the AppNav Controller.
- b) Enable node discovery by issuing the following commands:

Example:

```
auto-sn(config)# service-insertion service-node  
auto-sn(config-sn)# node-discovery enable GigabitEthernet 0/1  
auto-sn(config-sn)# enable
```

Licensing Requirements for the Cisco CSR 1000V Series

The AppNav feature will be available in the premium package, but in the Cisco IOS-XE 3.9 release, it is not enforced.

Licensing Requirements for the Cisco ASR 1000 Series

The AppNav feature will be available in the Advanced IP Services (AIS) and Adventerprise (AES) packages, but in the Cisco IOS-XE release 3.9, it is not enforced.

